

Results of Directional Survey

API number:	30-005-29102		
OGRID:		Operator:	CIMAREX ENERGY CO OF COLORADO
		Property:	VALLEY FORGE 20 STATE COM # 4 H

surface	ULSTR:	A	20	T	15S	R	31E
				375	FNL	375	FEL

BH Loc	ULSTR:	D	20	T	15S	R	31E
13233	MD	8726.4	TVD	385	FNL	4920	FEL

Top Perf/OH	ULSTR:	A	20	T	15S	R	31E
8366	MD	8365.5	TVD	329	FNL	371	FEL

Bot Perf/OH	ULSTR:	D	20	T	15S	R	31E
13233	MD	8726.4	TVD	385	FNL	4920	FEL

	MD	N/S	E/W	VD
	8316	45.90	3.54	8315.55
TOP PERFS/OH	8366	46.07	3.85	8365.50
	8410	46.22	4.13	8409.45
	13167	-12.28	-4479.27	8727.20
BOT PERFS/OH	13233	-10.31	-4545.23	8726.38
	13218	-10.76	-4530.24	8726.57

NEXT TO LAST	13167	-12.28	-4479.27	8727.20
LAST READING	13218	-10.76	-4530.24	8726.57
TD	13233	-10.31	-4545.23	8726.38

Surface Location	375	FN	375	FE
Projected BHL	385	FN	4920	FE
Location of				
Top Perfs/OH	329	FN	371	FE
Bottom Perfs/OH	385	FN	4920	FE

SUMMARY of Subsurface Locations

Surface Location	A-20-15S-31E	375	FN	375	FE	Vert. Depth
Top Perfs/OH	A-20-15S-31E	329	FN	371	FE	8365.50
Bottom Perfs/OH	D-20-15S-31E	385	FN	4920	FE	8726.38
Projected TD	D-20-15S-31E	385	FN	4920	FE	8726.38

Cimarex Energy Co.

Location Chaves County, NM
Field: (Valley) Sec 20, T15S, R31E
Facility: Valley Forge 20 State Com #4H

Slot: No. 4H SHL
Well: No. 4H
Wellbore: No. 4H PWB

Plot reference wellpath is Plan #2 vs Actual <FINAL>

True vertical depths are referenced to Rig on No. 4H SHL (RT)

Measured depths are referenced to Rig on No. 4H SHL (RT)

Rig on No. 4H SHL (RT) to Mean Sea Level 4448 feet

Mean Sea Level to Mud line (Facility Valley Forge 20 State Com #4H) -4427 feet

Coordinates are in feet referenced to Facility Center

Grid System NAD83 / TM New Mexico State Planes, Eastern Zone (3001), US feet

North Reference Grid north

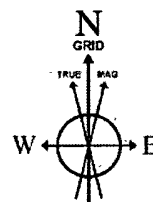
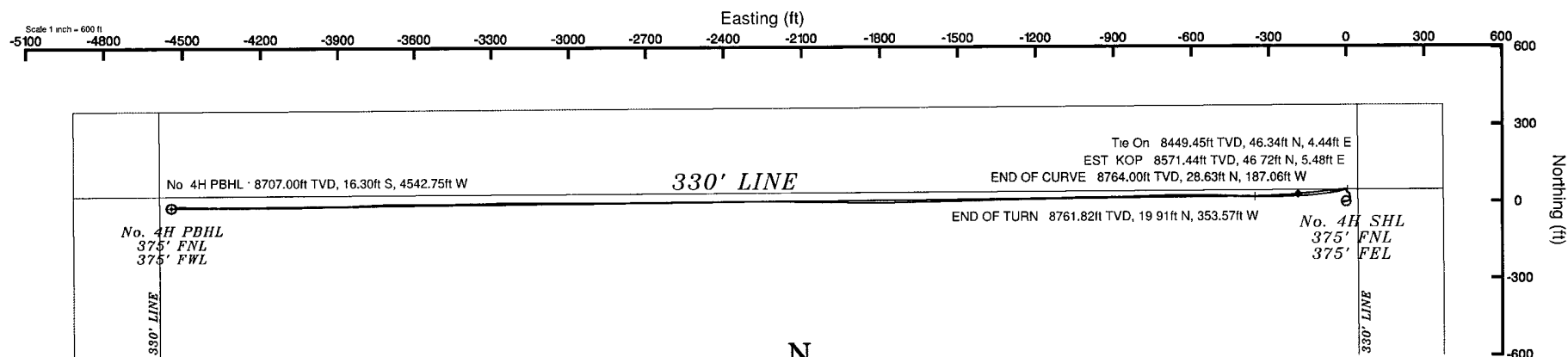
Scale True distance

Depths are in feet

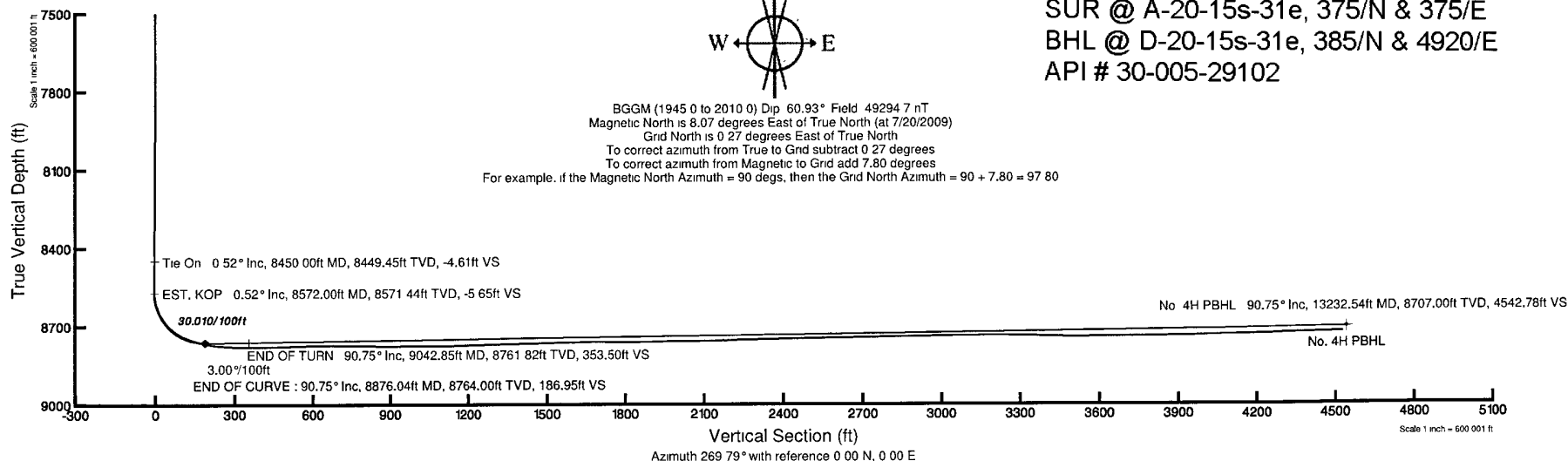
Created by Victor Hernandez on 3/24/2010

Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	8450.00	0.520	69.980	8449.45	46.34	4.44	0.00	-4.61
EST. KOP	8572.00	0.520	69.980	8571.44	46.72	5.48	0.00	-5.65
END OF CURVE	8876.04	90.750	264.500	8764.00	28.63	-187.06	30.01	186.95
END OF TURN	9042.85	90.750	269.505	8761.82	19.91	-353.57	3.00	353.50
No. 4H PBHL	13232.54	90.750	269.505	8707.00	-16.30	-4542.75	0.00	4542.78



SUR @ A-20-15s-31e, 375/N & 375/E
BHL @ D-20-15s-31e, 385/N & 4920/E
API # 30-005-29102





Actual Wellpath Report

No. 4H AWP

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HOBBSOCD INTEQ



REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Chaves County, NM	Well	No. 4H
Field	(Valley) Sec 20, T15S, R31E	Wellbore	No. 4H AWB
Facility	Valley Forge 20 State Com #4H		

REPORT SETUP INFORMATION			
Projection System	NAD83 / TM New Mexico State Planes, Eastern Zone (3001), US feet	Software System	WellArchitect® 2.0
North Reference	Grid	User	Victor Hernandez
Scale	0.999936	Report Generated	3/24/2010 at 9:10:18 AM
Convergence at slot	0.27° East	Database/Source file	WA_Midland/No._4H_AWB.xml

WELLPATH LOCATION						
	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[USft]	Northing[USft]	Latitude	Longitude
Slot Location	0.00	0.00	693597.80	730657.00	33°00'27.320"N	103°50'11.927"W
Facility Reference Pt			693597.80	730657.00	33°00'27.320"N	103°50'11.927"W
Field Reference Pt			693616.10	726126.50	32°59'42.492"N	103°50'11.963"W

WELLPATH DATUM			
Calculation method	Minimum curvature	Rig on No. 4H SHL (RT) to Facility Vertical Datum	21.00ft
Horizontal Reference Pt	Facility Center	Rig on No. 4H SHL (RT) to Mean Sea Level	4448.00ft
Vertical Reference Pt	Rig on No. 4H SHL (RT)	Facility Vertical Datum to Mud Line (Facility)	0.00ft
MD Reference Pt	Rig on No. 4H SHL (RT)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	269.79°



Actual Wellpath Report

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INTEQ

REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Chaves County, NM	Well	No. 4H
Field	(Valley) Sec 20, T15S, R31E	Wellbore	No. 4H AWP
Facility	Valley Forge 20 State Com #4H		

WELLPATH DATA (197 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	DLS [°/100ft]
0.00	0.000	261.760	0.00	0.00	0.00	0.00	693597.80	730657.00	33°00'27.320"N	103°50'11.927"W	0.00
146.80	0.300	261.760	146.80	0.38	-0.06	-0.38	693597.42	730656.94	33°00'27.319"N	103°50'11.932"W	0.20
240.70	0.140	233.970	240.70	0.72	-0.16	-0.72	693597.08	730656.84	33°00'27.318"N	103°50'11.936"W	0.20
334.60	0.340	232.650	334.60	1.03	-0.39	-1.03	693596.77	730656.61	33°00'27.316"N	103°50'11.939"W	0.21
428.50	0.480	258.140	428.50	1.64	-0.64	-1.64	693596.16	730656.36	33°00'27.313"N	103°50'11.946"W	0.24
522.40	0.490	260.320	522.39	2.42	-0.79	-2.42	693595.38	730656.21	33°00'27.312"N	103°50'11.956"W	0.02
616.30	0.520	257.180	616.29	3.23	-0.95	-3.23	693594.57	730656.05	33°00'27.311"N	103°50'11.965"W	0.04
710.20	0.490	255.760	710.18	4.04	-1.15	-4.03	693593.77	730655.85	33°00'27.309"N	103°50'11.975"W	0.03
804.10	0.520	254.610	804.08	4.84	-1.36	-4.83	693592.97	730655.64	33°00'27.307"N	103°50'11.984"W	0.03
898.00	0.560	255.760	897.98	5.69	-1.59	-5.69	693592.11	730655.41	33°00'27.304"N	103°50'11.994"W	0.04
991.90	0.520	259.610	991.87	6.56	-1.78	-6.55	693591.25	730655.22	33°00'27.303"N	103°50'12.004"W	0.06
1085.80	0.490	253.650	1085.77	7.36	-1.97	-7.36	693590.44	730655.03	33°00'27.301"N	103°50'12.014"W	0.06
1179.70	0.510	250.780	1179.67	8.15	-2.22	-8.14	693589.66	730654.78	33°00'27.298"N	103°50'12.023"W	0.03
1273.60	0.430	247.870	1273.56	8.87	-2.49	-8.86	693588.94	730654.51	33°00'27.296"N	103°50'12.031"W	0.09
1367.50	0.250	245.890	1367.46	9.38	-2.70	-9.37	693588.43	730654.30	33°00'27.293"N	103°50'12.037"W	0.19
1461.40	0.110	241.180	1461.36	9.65	-2.83	-9.64	693588.16	730654.17	33°00'27.292"N	103°50'12.040"W	0.15
1555.30	0.100	230.450	1555.26	9.79	-2.93	-9.78	693588.02	730654.07	33°00'27.291"N	103°50'12.042"W	0.02
1649.20	0.120	132.200	1649.16	9.78	-3.04	-9.77	693588.03	730653.96	33°00'27.290"N	103°50'12.042"W	0.18
1743.10	0.320	103.690	1743.06	9.45	-3.17	-9.44	693588.36	730653.83	33°00'27.289"N	103°50'12.038"W	0.24
1837.00	0.660	95.510	1836.96	8.66	-3.29	-8.65	693589.15	730653.71	33°00'27.288"N	103°50'12.029"W	0.37
1930.90	1.060	89.570	1930.84	7.25	-3.33	-7.24	693590.56	730653.67	33°00'27.287"N	103°50'12.012"W	0.44
2024.80	1.390	80.620	2024.72	5.26	-3.14	-5.25	693592.55	730653.86	33°00'27.289"N	103°50'11.989"W	0.41
2118.70	1.630	74.230	2118.59	2.85	-2.59	-2.84	693594.96	730654.41	33°00'27.294"N	103°50'11.961"W	0.31
2212.60	1.660	72.180	2212.45	0.27	-1.81	-0.26	693597.54	730655.19	33°00'27.302"N	103°50'11.930"W	0.07
2306.50	1.550	73.360	2306.32	-2.25	-1.03	2.25	693600.05	730655.97	33°00'27.309"N	103°50'11.901"W	0.12
2400.40	1.470	70.370	2400.18	-4.60	-0.26	4.60	693602.40	730656.74	33°00'27.317"N	103°50'11.873"W	0.12
2494.30	1.270	63.440	2494.06	-6.67	0.61	6.67	693604.47	730657.61	33°00'27.325"N	103°50'11.849"W	0.28
2588.20	1.270	62.270	2587.93	-8.52	1.56	8.52	693606.32	730658.56	33°00'27.335"N	103°50'11.827"W	0.03
2682.10	1.100	58.490	2681.81	-10.22	2.51	10.21	693608.01	730659.51	33°00'27.344"N	103°50'11.807"W	0.20
2776.00	0.960	51.690	2775.70	-11.61	3.47	11.59	693609.39	730660.47	33°00'27.354"N	103°50'11.791"W	0.20



Actual Wellpath Report

No. 4H AWP

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INTEQ

REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Chaves County, NM	Well	No. 4H
Field	(Valley) Sec 20, T15S, R31E	Wellbore	No. 4H AWB
Facility	Valley Forge 20 State Com #4H		

WELLPATH DATA (197 stations)											
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	DLS [°/100ft]
2869.90	0.760	41.450	2869.59	-12.64	4.42	12.62	693610.42	730661.42	33°00'27.363"N	103°50'11.779"W	0.27
2963.80	0.730	36.310	2963.48	-13.41	5.37	13.39	693611.19	730662.37	33°00'27.372"N	103°50'11.770"W	0.08
3057.70	0.700	38.950	3057.37	-14.13	6.30	14.10	693611.90	730663.30	33°00'27.381"N	103°50'11.761"W	0.05
3151.60	0.640	34.990	3151.27	-14.79	7.18	14.77	693612.56	730664.18	33°00'27.390"N	103°50'11.753"W	0.08
3245.50	0.650	27.460	3245.16	-15.34	8.08	15.31	693613.11	730665.08	33°00'27.399"N	103°50'11.747"W	0.09
3339.40	0.570	20.090	3339.05	-15.75	8.99	15.72	693613.52	730665.99	33°00'27.408"N	103°50'11.742"W	0.12
3433.30	0.490	10.590	3432.95	-15.99	9.82	15.95	693613.75	730666.82	33°00'27.416"N	103°50'11.739"W	0.13
3527.20	0.600	359.590	3526.85	-16.06	10.71	16.02	693613.82	730667.71	33°00'27.425"N	103°50'11.738"W	0.16
3621.10	0.690	354.460	3620.74	-16.01	11.76	15.96	693613.76	730668.76	33°00'27.435"N	103°50'11.739"W	0.11
3715.00	0.780	351.520	3714.63	-15.86	12.96	15.82	693613.61	730669.96	33°00'27.447"N	103°50'11.741"W	0.10
3808.90	0.790	350.300	3808.52	-15.66	14.23	15.61	693613.41	730671.23	33°00'27.460"N	103°50'11.743"W	0.02
3902.80	0.670	342.410	3902.42	-15.39	15.39	15.34	693613.14	730672.39	33°00'27.471"N	103°50'11.746"W	0.17
3996.70	0.640	337.960	3996.31	-15.03	16.40	14.97	693612.77	730673.40	33°00'27.481"N	103°50'11.750"W	0.06
4090.60	0.630	338.140	4090.20	-14.65	17.37	14.59	693612.38	730674.36	33°00'27.491"N	103°50'11.755"W	0.01
4184.50	0.610	338.430	4184.10	-14.27	18.31	14.21	693612.01	730675.31	33°00'27.500"N	103°50'11.759"W	0.02
4278.40	0.560	340.840	4277.99	-13.94	19.21	13.87	693611.67	730676.21	33°00'27.509"N	103°50'11.763"W	0.06
4372.30	0.530	344.490	4371.89	-13.68	20.06	13.61	693611.41	730677.06	33°00'27.518"N	103°50'11.766"W	0.05
4466.20	0.530	348.720	4465.79	-13.48	20.90	13.41	693611.21	730677.90	33°00'27.526"N	103°50'11.769"W	0.04
4560.10	0.540	347.170	4559.68	-13.30	21.76	13.22	693611.02	730678.76	33°00'27.534"N	103°50'11.771"W	0.02
4654.00	0.600	347.800	4653.58	-13.10	22.67	13.02	693610.82	730679.67	33°00'27.544"N	103°50'11.773"W	0.06
4747.90	0.600	351.860	4747.47	-12.93	23.64	12.85	693610.65	730680.64	33°00'27.553"N	103°50'11.775"W	0.05
4841.80	0.580	351.030	4841.37	-12.79	24.60	12.70	693610.50	730681.60	33°00'27.563"N	103°50'11.777"W	0.02
4935.70	0.500	357.810	4935.26	-12.71	25.48	12.61	693610.41	730682.47	33°00'27.571"N	103°50'11.778"W	0.11
5029.60	0.300	348.490	5029.16	-12.64	26.13	12.55	693610.35	730683.12	33°00'27.578"N	103°50'11.778"W	0.22
5123.50	0.370	335.170	5123.06	-12.47	26.64	12.37	693610.17	730683.64	33°00'27.583"N	103°50'11.780"W	0.11
5217.40	0.380	338.720	5216.96	-12.23	27.21	12.13	693609.93	730684.21	33°00'27.588"N	103°50'11.783"W	0.03
5311.30	0.380	335.950	5310.85	-11.99	27.78	11.89	693609.69	730684.78	33°00'27.594"N	103°50'11.786"W	0.02
5405.20	0.370	335.060	5404.75	-11.74	28.34	11.64	693609.44	730685.34	33°00'27.600"N	103°50'11.789"W	0.01
5499.10	0.310	325.730	5498.65	-11.47	28.83	11.37	693609.17	730685.82	33°00'27.604"N	103°50'11.792"W	0.09
5593.00	0.300	338.020	5592.55	-11.24	29.26	11.13	693608.93	730686.26	33°00'27.609"N	103°50'11.795"W	0.07



Actual Wellpath Report

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INTEQ

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Area	Chaves County, NM	Well	No. 4H
Field	(Valley) Sec 20, T15S, R31E	Wellbore	No. 4H AWP
Facility	Valley Forge 20 State Com #4H		

WELLPATH DATA (197 stations)											
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	DLS [°/100ft]
5686.90	0.170	343.790	5686.45	-11.11	29.63	11.00	693608.80	730686.62	33°00'27.612"N	103°50'11.796"W	0.14
5780.80	0.150	346.140	5780.35	-11.04	29.88	10.93	693608.73	730686.88	33°00'27.615"N	103°50'11.797"W	0.02
5874.70	0.200	340.920	5874.25	-10.96	30.15	10.85	693608.65	730687.15	33°00'27.618"N	103°50'11.798"W	0.06
5968.60	0.230	327.970	5968.15	-10.81	30.47	10.70	693608.50	730687.47	33°00'27.621"N	103°50'11.800"W	0.06
6062.50	0.280	313.210	6062.05	-10.54	30.78	10.43	693608.23	730687.78	33°00'27.624"N	103°50'11.803"W	0.09
6156.40	0.320	298.210	6155.94	-10.14	31.07	10.03	693607.83	730688.06	33°00'27.627"N	103°50'11.808"W	0.09
6250.30	0.350	294.290	6249.84	-9.65	31.31	9.54	693607.34	730688.31	33°00'27.629"N	103°50'11.813"W	0.04
6344.20	0.400	299.610	6343.74	-9.11	31.59	8.99	693606.79	730688.59	33°00'27.632"N	103°50'11.820"W	0.06
6438.10	0.430	306.950	6437.64	-8.54	31.96	8.43	693606.23	730688.96	33°00'27.636"N	103°50'11.826"W	0.06
6532.00	0.450	313.300	6531.54	-7.99	32.43	7.88	693605.68	730689.42	33°00'27.640"N	103°50'11.833"W	0.06
6625.90	0.480	301.650	6625.43	-7.39	32.89	7.27	693605.07	730689.88	33°00'27.645"N	103°50'11.840"W	0.11
6719.80	0.440	298.830	6719.33	-6.74	33.27	6.62	693604.42	730690.26	33°00'27.649"N	103°50'11.848"W	0.05
6813.70	0.450	299.320	6813.23	-6.11	33.62	5.98	693603.78	730690.62	33°00'27.652"N	103°50'11.855"W	0.01
6907.60	0.500	303.630	6907.12	-5.44	34.03	5.32	693603.12	730691.03	33°00'27.656"N	103°50'11.863"W	0.07
7001.50	0.590	311.890	7001.02	-4.75	34.58	4.62	693602.42	730691.58	33°00'27.662"N	103°50'11.871"W	0.13
7095.40	0.670	322.710	7094.91	-4.06	35.34	3.93	693601.73	730692.33	33°00'27.669"N	103°50'11.879"W	0.15
7189.30	0.720	327.100	7188.81	-3.41	36.27	3.28	693601.08	730693.27	33°00'27.678"N	103°50'11.887"W	0.08
7283.20	0.740	329.630	7282.70	-2.78	37.29	2.65	693600.45	730694.29	33°00'27.689"N	103°50'11.894"W	0.04
7377.10	0.700	333.800	7376.59	-2.23	38.33	2.09	693599.89	730695.32	33°00'27.699"N	103°50'11.901"W	0.07
7471.00	0.720	338.090	7470.48	-1.76	39.39	1.62	693599.42	730696.38	33°00'27.709"N	103°50'11.906"W	0.06
7564.90	0.640	346.620	7564.38	-1.42	40.45	1.27	693599.07	730697.44	33°00'27.720"N	103°50'11.910"W	0.14
7658.80	0.560	355.610	7658.27	-1.27	41.41	1.12	693598.92	730698.41	33°00'27.729"N	103°50'11.912"W	0.13
7752.70	0.420	5.130	7752.17	-1.26	42.21	1.11	693598.91	730699.21	33°00'27.737"N	103°50'11.912"W	0.17
7846.60	0.450	15.630	7846.07	-1.40	42.91	1.24	693599.04	730699.91	33°00'27.744"N	103°50'11.910"W	0.09
7940.50	0.510	22.750	7939.96	-1.66	43.65	1.50	693599.30	730700.65	33°00'27.752"N	103°50'11.907"W	0.09
8034.40	0.520	32.170	8033.86	-2.05	44.40	1.89	693599.69	730701.39	33°00'27.759"N	103°50'11.902"W	0.09
8128.30	0.500	46.230	8127.78	-2.58	45.04	2.42	693600.22	730702.04	33°00'27.765"N	103°50'11.896"W	0.13
8222.20	0.430	54.660	8221.65	-3.16	45.53	3.00	693600.80	730702.53	33°00'27.770"N	103°50'11.889"W	0.10
8316.10	0.370	56.460	8315.55	-3.70	45.90	3.54	693601.34	730702.90	33°00'27.774"N	103°50'11.883"W	0.07
8410.00	0.450	66.180	8409.45	-4.29	46.22	4.13	693601.93	730703.21	33°00'27.777"N	103°50'11.876"W	0.11



Actual Wellpath Report

No. 4H AWP

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INTEQ

REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Chaves County, NM	Well	No. 4H
Field	(Valley) Sec 20, T15S, R31E	Wellbore	No. 4H AWB
Facility	Valley Forge 20 State Com #4H		

WELLPATH DATA (197 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	DLS [°/100ft]
8450.00	0.520	69.980	8449.45	-4.61	46.34	4.44	693602.24	730703.34	33°00'27.778"N	103°50'11.872"W	0.19
8497.00	0.300	93.400	8496.45	-4.93	46.41	4.77	693602.57	730703.40	33°00'27.779"N	103°50'11.869"W	0.58
8529.00	0.300	6.400	8528.45	-5.03	46.49	4.86	693602.66	730703.48	33°00'27.779"N	103°50'11.868"W	1.29
8561.00	0.800	355.000	8560.44	-5.02	46.79	4.85	693602.65	730703.79	33°00'27.783"N	103°50'11.868"W	1.59
8592.00	6.900	263.500	8591.37	-3.15	46.80	2.98	693600.78	730703.79	33°00'27.783"N	103°50'11.890"W	22.47
8624.00	16.900	253.100	8622.64	3.24	45.22	-3.40	693594.40	730702.22	33°00'27.767"N	103°50'11.965"W	31.84
8656.00	27.000	253.100	8652.29	14.68	41.75	-14.83	693582.97	730698.75	33°00'27.734"N	103°50'12.099"W	31.56
8687.00	36.200	258.500	8678.67	30.43	37.87	-30.57	693567.23	730694.87	33°00'27.696"N	103°50'12.284"W	31.02
8719.00	45.600	260.900	8702.83	51.04	34.17	-51.16	693546.64	730691.17	33°00'27.660"N	103°50'12.526"W	29.78
8751.00	55.300	263.400	8723.18	75.47	30.84	-75.58	693522.22	730687.84	33°00'27.628"N	103°50'12.813"W	30.90
8782.00	62.500	261.200	8739.18	101.76	27.27	-101.86	693495.94	730684.27	33°00'27.594"N	103°50'13.122"W	24.01
8814.00	71.300	266.000	8751.73	130.99	24.03	-131.08	693466.73	730681.03	33°00'27.564"N	103°50'13.465"W	30.76
8846.00	75.400	267.100	8760.90	161.59	22.19	-161.67	693436.14	730679.19	33°00'27.547"N	103°50'13.824"W	13.23
8877.00	78.000	267.400	8768.03	191.73	20.74	-191.81	693406.01	730677.74	33°00'27.534"N	103°50'14.178"W	8.44
8909.00	82.200	268.400	8773.53	223.23	19.59	-223.30	693374.51	730676.59	33°00'27.524"N	103°50'14.548"W	13.48
8940.00	84.600	268.300	8777.09	254.01	18.70	-254.08	693343.74	730675.70	33°00'27.517"N	103°50'14.910"W	7.75
8972.00	88.000	268.300	8779.16	285.93	17.76	-285.99	693311.82	730674.76	33°00'27.509"N	103°50'15.284"W	10.62
9004.00	90.300	269.600	8779.63	317.92	17.17	-317.98	693279.84	730674.17	33°00'27.505"N	103°50'15.660"W	8.26
9036.00	89.900	271.800	8779.58	349.91	17.56	-349.98	693247.84	730674.56	33°00'27.510"N	103°50'16.036"W	6.99
9067.00	89.500	271.700	8779.74	380.89	18.51	-380.96	693216.86	730675.51	33°00'27.521"N	103°50'16.400"W	1.33
9099.00	90.300	272.000	8779.80	412.87	19.54	-412.95	693184.88	730676.54	33°00'27.532"N	103°50'16.775"W	2.67
9131.00	90.600	272.400	8779.55	444.84	20.77	-444.92	693152.91	730677.77	33°00'27.546"N	103°50'17.150"W	1.56
9162.00	91.500	272.500	8778.98	475.81	22.09	-475.89	693121.94	730679.09	33°00'27.561"N	103°50'17.514"W	2.92
9189.00	91.300	271.800	8778.32	502.77	23.11	-502.86	693094.97	730680.11	33°00'27.572"N	103°50'17.831"W	2.70
9221.00	91.700	270.900	8777.48	534.75	23.86	-534.84	693063.00	730680.86	33°00'27.581"N	103°50'18.206"W	3.08
9253.00	92.200	271.100	8776.39	566.73	24.42	-566.82	693031.02	730681.42	33°00'27.588"N	103°50'18.582"W	1.68
9284.00	91.700	270.400	8775.34	597.70	24.82	-597.80	693000.04	730681.82	33°00'27.593"N	103°50'18.945"W	2.77
9316.00	89.900	269.100	8774.89	629.70	24.69	-629.79	692968.05	730681.68	33°00'27.593"N	103°50'19.321"W	6.94
9348.00	89.500	268.600	8775.06	661.69	24.04	-661.78	692936.06	730681.04	33°00'27.589"N	103°50'19.697"W	2.00
9411.00	89.600	268.100	8775.55	724.67	22.23	-724.76	692873.09	730679.23	33°00'27.574"N	103°50'20.436"W	0.81



Actual Wellpath Report

No. 4H AWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Chaves County, NM	Well	No. 4H
Field	(Valley) Sec 20, T15S, R31E	Wellbore	No. 4H AWB
Facility	Valley Forge 20 State Com #4H		

WELLPATH DATA (197 stations)											
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	DLS [°/100ft]
9474.00	89.000	268.000	8776.32	787.64	20.09	-787.71	692810.14	730677.08	33°00'27.555"N	103°50'21.176"W	0.97
9506.00	89.200	268.100	8776.82	819.62	19.00	-819.69	692778.16	730676.00	33°00'27.546"N	103°50'21.551"W	0.70
9569.00	89.700	269.300	8777.43	882.60	17.57	-882.67	692715.19	730674.57	33°00'27.535"N	103°50'22.291"W	2.06
9632.00	90.900	269.800	8777.10	945.60	17.07	-945.67	692652.20	730674.07	33°00'27.533"N	103°50'23.031"W	2.06
9664.00	91.100	270.100	8776.54	977.59	17.04	-977.66	692620.20	730674.04	33°00'27.534"N	103°50'23.406"W	1.13
9696.00	88.900	268.900	8776.54	1009.59	16.77	-1009.66	692588.21	730673.76	33°00'27.533"N	103°50'23.782"W	7.83
9727.00	89.400	268.200	8777.00	1040.58	15.98	-1040.64	692557.22	730672.98	33°00'27.526"N	103°50'24.146"W	2.77
9758.00	90.100	268.000	8777.14	1071.57	14.95	-1071.63	692526.24	730671.95	33°00'27.518"N	103°50'24.510"W	2.35
9790.00	90.700	267.600	8776.91	1103.55	13.72	-1103.60	692494.27	730670.72	33°00'27.507"N	103°50'24.885"W	2.25
9854.00	91.500	269.000	8775.68	1167.51	11.83	-1167.56	692430.32	730668.83	33°00'27.491"N	103°50'25.636"W	2.52
9917.00	91.700	268.900	8773.92	1230.48	10.67	-1230.52	692367.36	730667.67	33°00'27.483"N	103°50'26.376"W	0.35
9980.00	91.700	269.100	8772.06	1293.44	9.57	-1293.49	692304.40	730666.57	33°00'27.475"N	103°50'27.115"W	0.32
10043.00	90.900	268.700	8770.63	1356.42	8.36	-1356.46	692241.43	730665.36	33°00'27.466"N	103°50'27.855"W	1.42
10075.00	90.600	268.400	8770.21	1388.41	7.55	-1388.45	692209.45	730664.55	33°00'27.459"N	103°50'28.230"W	1.33
10107.00	90.500	268.000	8769.90	1420.40	6.55	-1420.43	692177.47	730663.55	33°00'27.451"N	103°50'28.606"W	1.29
10139.00	91.600	268.400	8769.31	1452.38	5.54	-1452.41	692145.49	730662.54	33°00'27.442"N	103°50'28.982"W	3.66
10202.00	92.300	269.000	8767.17	1515.33	4.12	-1515.35	692082.55	730661.12	33°00'27.431"N	103°50'29.721"W	1.46
10234.00	91.800	268.300	8766.03	1547.30	3.36	-1547.32	692050.58	730660.36	33°00'27.425"N	103°50'30.096"W	2.69
10297.00	91.200	269.000	8764.38	1610.27	1.88	-1610.28	691987.62	730658.88	33°00'27.413"N	103°50'30.836"W	1.46
10329.00	91.700	269.000	8763.57	1642.25	1.32	-1642.27	691955.64	730658.32	33°00'27.409"N	103°50'31.211"W	1.56
10361.00	90.700	269.000	8762.90	1674.24	0.76	-1674.26	691923.65	730657.76	33°00'27.405"N	103°50'31.587"W	3.12
10392.00	89.300	268.300	8762.90	1705.24	0.03	-1705.25	691892.67	730657.03	33°00'27.399"N	103°50'31.951"W	5.05
10424.00	89.200	268.000	8763.32	1737.22	-1.00	-1737.23	691860.69	730656.00	33°00'27.391"N	103°50'32.326"W	0.99
10456.00	89.300	269.300	8763.73	1769.21	-1.75	-1769.22	691828.70	730655.25	33°00'27.385"N	103°50'32.702"W	4.07
10488.00	90.300	269.800	8763.85	1801.21	-2.01	-1801.21	691796.71	730654.99	33°00'27.384"N	103°50'33.078"W	3.49
10551.00	91.300	270.800	8762.97	1864.20	-1.68	-1864.20	691733.72	730655.32	33°00'27.390"N	103°50'33.817"W	2.24
10646.00	90.900	270.400	8761.14	1959.17	-0.68	-1959.18	691638.75	730656.32	33°00'27.404"N	103°50'34.933"W	0.60
10710.00	90.200	270.600	8760.53	2023.16	-0.12	-2023.18	691574.76	730656.88	33°00'27.412"N	103°50'35.684"W	1.14
10805.00	91.000	271.600	8759.53	2118.13	1.70	-2118.15	691479.79	730658.70	33°00'27.435"N	103°50'36.799"W	1.35
10869.00	92.100	270.900	8757.80	2182.09	3.10	-2182.11	691415.83	730660.10	33°00'27.452"N	103°50'37.550"W	2.04



Actual Wellpath Report

No. 4H AWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Chaves County, NM	Well	No. 4H
Field	(Valley) Sec 20, T15S, R31E	Wellbore	No. 4H AWB
Facility	Valley Forge 20 State Com #4H		

WELLPATH DATA (197 stations)											
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	DLS [°/100ft]
10900.00	92.400	270.900	8756.58	2213.06	3.58	-2213.08	691384.86	730660.58	33°00'27.458"N	103°50'37.914"W	0.97
10964.00	91.100	269.400	8754.63	2277.02	3.75	-2277.05	691320.90	730660.75	33°00'27.462"N	103°50'38.665"W	3.10
11058.00	91.300	269.500	8752.66	2371.00	2.85	-2371.03	691226.93	730659.85	33°00'27.458"N	103°50'39.768"W	0.24
11090.00	91.800	269.800	8751.80	2402.99	2.65	-2403.01	691194.95	730659.65	33°00'27.457"N	103°50'40.144"W	1.82
11153.00	90.800	269.900	8750.37	2465.97	2.49	-2466.00	691131.97	730659.49	33°00'27.459"N	103°50'40.884"W	1.60
11215.00	91.000	269.800	8749.39	2527.96	2.33	-2527.99	691069.98	730659.32	33°00'27.460"N	103°50'41.612"W	0.36
11310.00	90.900	269.400	8747.82	2622.95	1.66	-2622.97	690975.00	730658.66	33°00'27.458"N	103°50'42.727"W	0.43
11406.00	91.300	269.300	8745.98	2718.93	0.57	-2718.95	690879.03	730657.57	33°00'27.451"N	103°50'43.854"W	0.43
11469.00	90.900	269.200	8744.77	2781.91	-0.25	-2781.93	690816.05	730656.75	33°00'27.446"N	103°50'44.594"W	0.65
11532.00	90.500	269.900	8744.00	2844.91	-0.75	-2844.92	690753.07	730656.25	33°00'27.444"N	103°50'45.333"W	1.28
11627.00	91.200	270.100	8742.59	2939.90	-0.75	-2939.91	690658.08	730656.25	33°00'27.448"N	103°50'46.449"W	0.77
11690.00	91.200	271.100	8741.27	3002.88	-0.09	-3002.89	690595.10	730656.91	33°00'27.458"N	103°50'47.188"W	1.59
11722.00	91.900	271.100	8740.40	3034.86	0.53	-3034.88	690563.12	730657.53	33°00'27.465"N	103°50'47.564"W	2.19
11754.00	90.300	271.500	8739.79	3066.84	1.25	-3066.86	690531.14	730658.25	33°00'27.474"N	103°50'47.939"W	5.15
11786.00	90.500	270.500	8739.56	3098.83	1.81	-3098.86	690499.15	730658.81	33°00'27.481"N	103°50'48.315"W	3.19
11817.00	90.700	269.500	8739.24	3129.83	1.81	-3129.85	690468.15	730658.81	33°00'27.482"N	103°50'48.679"W	3.29
11849.00	91.300	269.800	8738.68	3161.82	1.62	-3161.85	690436.16	730658.62	33°00'27.482"N	103°50'49.055"W	2.10
11880.00	89.900	269.700	8738.36	3192.82	1.48	-3192.84	690405.17	730658.48	33°00'27.482"N	103°50'49.419"W	4.53
11912.00	89.000	269.100	8738.66	3224.82	1.15	-3224.84	690373.17	730658.15	33°00'27.480"N	103°50'49.794"W	3.38
11944.00	89.400	268.800	8739.11	3256.81	0.56	-3256.83	690341.18	730657.56	33°00'27.476"N	103°50'50.170"W	1.56
12039.00	88.400	268.600	8740.93	3351.77	-1.60	-3351.79	690246.23	730655.40	33°00'27.459"N	103°50'51.285"W	1.07
12071.00	88.300	268.200	8741.86	3383.75	-2.49	-3383.76	690214.26	730654.51	33°00'27.452"N	103°50'51.661"W	1.29
12102.00	88.500	268.300	8742.72	3414.73	-3.43	-3414.74	690183.29	730653.57	33°00'27.444"N	103°50'52.024"W	0.72
12134.00	88.300	268.400	8743.61	3446.70	-4.36	-3446.71	690151.32	730652.64	33°00'27.436"N	103°50'52.400"W	0.70
12166.00	89.200	268.700	8744.31	3478.69	-5.17	-3478.69	690119.34	730651.84	33°00'27.429"N	103°50'52.776"W	2.96
12197.00	90.000	269.500	8744.53	3509.69	-5.65	-3509.69	690088.34	730651.35	33°00'27.426"N	103°50'53.140"W	3.65
12229.00	90.600	270.800	8744.36	3541.68	-5.57	-3541.69	690056.35	730651.43	33°00'27.428"N	103°50'53.515"W	4.47
12261.00	91.000	271.300	8743.91	3573.67	-4.98	-3573.68	690024.36	730652.02	33°00'27.436"N	103°50'53.891"W	2.00
12293.00	90.800	271.000	8743.41	3605.66	-4.34	-3605.67	689992.37	730652.66	33°00'27.443"N	103°50'54.267"W	1.13
12324.00	90.500	271.400	8743.06	3636.65	-3.69	-3636.66	689961.38	730653.31	33°00'27.451"N	103°50'54.630"W	1.61



Actual Wellpath Report

No. 4H AWP

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INTEQ

REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Chaves County, NM	Well	No. 4H
Field	(Valley) Sec 20, T15S, R31E	Wellbore	No. 4H AWB
Facility	Valley Forge 20 State Com #4H		

WELLPATH DATA (197 stations)											
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	DLS [°/100ft]
12355.00	91.000	269.600	8742.65	3667.64	-3.42	-3667.65	689930.39	730653.58	33°00'27.455"N	103°50'54.994"W	6.03
12387.00	90.300	267.800	8742.29	3699.63	-4.15	-3699.64	689898.40	730652.85	33°00'27.450"N	103°50'55.370"W	6.04
12419.00	89.700	267.300	8742.29	3731.61	-5.51	-3731.61	689866.44	730651.49	33°00'27.437"N	103°50'55.745"W	2.44
12451.00	90.100	267.400	8742.35	3763.58	-6.99	-3763.58	689834.47	730650.01	33°00'27.424"N	103°50'56.121"W	1.29
12482.00	91.100	267.900	8742.02	3794.55	-8.26	-3794.55	689803.50	730648.74	33°00'27.413"N	103°50'56.485"W	3.61
12514.00	90.900	268.100	8741.46	3826.53	-9.38	-3826.53	689771.53	730647.62	33°00'27.404"N	103°50'56.860"W	0.88
12546.00	90.600	268.300	8741.05	3858.52	-10.39	-3858.51	689739.55	730646.61	33°00'27.395"N	103°50'57.236"W	1.13
12577.00	91.200	268.400	8740.56	3889.51	-11.28	-3889.49	689708.57	730645.72	33°00'27.388"N	103°50'57.600"W	1.96
12609.00	91.300	268.700	8739.86	3921.49	-12.09	-3921.47	689676.59	730644.91	33°00'27.381"N	103°50'57.975"W	0.99
12704.00	91.600	269.300	8737.46	4016.45	-13.75	-4016.43	689581.64	730643.26	33°00'27.369"N	103°50'59.090"W	0.71
12799.00	91.100	269.300	8735.22	4111.42	-14.91	-4111.39	689486.68	730642.09	33°00'27.362"N	103°51'00.206"W	0.53
12830.00	91.200	269.400	8734.60	4142.41	-15.26	-4142.38	689455.69	730641.74	33°00'27.360"N	103°51'00.569"W	0.46
12925.00	91.300	270.000	8732.52	4237.39	-15.75	-4237.36	689360.72	730641.25	33°00'27.359"N	103°51'01.685"W	0.64
12988.00	91.500	270.600	8730.98	4300.37	-15.43	-4300.34	689297.75	730641.58	33°00'27.365"N	103°51'02.424"W	1.00
13083.00	91.300	270.900	8728.66	4395.33	-14.18	-4395.30	689202.79	730642.82	33°00'27.382"N	103°51'03.539"W	0.38
13167.00	90.700	271.700	8727.20	4479.28	-12.28	-4479.27	689118.83	730644.72	33°00'27.405"N	103°51'04.525"W	1.19
13218.00	90.700	271.700	8726.57	4530.25	-10.76	-4530.24	689067.86	730646.24	33°00'27.422"N	103°51'05.124"W	0.00



Actual Wellpath Report

No. 4H AWP

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INTEQ

REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 4H SHL
Area	Chaves County, NM	Well	No. 4H
Field	(Valley) Sec 20, T15S, R31E	Wellbore	No. 4H AWB
Facility	Valley Forge 20 State Com #4H		

TARGETS									
Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	Shape
No. 4H PBHL		8707.00	-16.30	-4542.75	689055.35	730640.70	33°00'27.368"N	103°51'05.271"W	point

WELLPATH COMPOSITION					Ref Wellbore: No. 4H AWB	Ref Wellpath: No. 4H AWP
Start MD [ft]	End MD [ft]	Positional Uncertainty Model			Log Name/Comment	Wellbore
0.00	8450.00	Gyrodatta relative depth - Drop gyro or Multi-shot			GYRO <146.8 - 8450>	No. 4H AWB
8450.00	13167.00	NaviTrak (Standard)			MWD <8497 - 13167>	No. 4H AWB
13167.00	13218.00	Blind Drilling (std)			Projection to bit	No. 4H AWB